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Automatic Transmission Line Monitor

An operational, automatic circuit-performance monitor can greatly improve the reliability of complex networks in such applications as computer data links and command transmission lines. The monitoring system evaluates circuit performance against preselected criteria, identifies and stores data indicating out-of-tolerance conditions, conducts closed loop testing, and provides for operation under command of a digital computer that determines restoration priorities in the event of a malfunction. The design permits on-line, real-time monitoring of operational data, and automatically inserts required test signals during quiescent (or scheduled maintenance) periods. The system is designed for use with transmission networks where absolute reliability is necessary, where restoration priorities may be variable, and where conventional maintenance routines would be too expensive.

The monitor provides for automatic scanning and sequential sampling of the various channels in communication and data-transmission links that carry the following types of information: (1) Wordburst digital data, at bit rates up to 1 MHz (e.g., computer or teletype messages); (2) continuous digital data, at bit rates up to 1 MHz (e.g., messages transmitted as pulse code modulation; and, (3) continuous analog data at frequencies up to 500 kHz (e.g., FM communications). The current design will accommodate up to 128 inputs with any combination of the above data types, and may be readily expanded to handle additional inputs.

The major monitor subsystems and their functions are as follows:

- (1) A programmer, the heart of the system, controls all functions and performs necessary computations or the other subsystems.

- (2) An electronic scanner sequentially samples, upon request, any combination of the circuits being monitored by the system.
- (3) Analytical circuitry determines the condition of the circuits being sampled. Results are forwarded to the programmer for dispatching.
- (4) A display and control panel, functioning directly through the programmer, provides operations and maintenance personnel with the necessary controls and indicators for operating the monitoring system.
- (5) Signal generators, on command from the display and control panel, produce signals for closed loop testing of quiescent circuits. For controlled testing, the signals are made to duplicate normal traffic patterns.
- (6) A computer interface unit provides for two-way communications between the monitoring system and a digital computer complex.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
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Patent status:

This is the invention of NASA employees and a patent application has been filed. Inquiries concerning license rights may be made directly to the inventors, Mr. L. O. Richards and Mr. W. E. Parsons, at the Kennedy Space Center, Florida 32899.

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